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**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Docket Number (Optional)

YOR920030633US1

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Application Number

10/775,854

Filed

February 10, 2004

First Named Inventor

Bapst et al.

Art Unit

2883

Examiner

Jerry M. Blevins

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor

☐ assignee of record of the entire interest.  
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96)

☒ attorney or agent of record  
Registration number 36,597

☐ attorney or agent acting under 37 CFR 1.34  
Registration number if acting under 37 CFR 1.34 \_\_\_\_\_

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November 14, 2006

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ \*Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P O Box 1450, Alexandria, VA 22313-1450

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): Bapst et al.  
Docket No.: YOR920030633US1  
Serial No.: 10/775,854  
Filing Date: February 10, 2004  
Group: 2883  
Examiner: Jerry M. Blevins

Title: Circuit Board Integrated Optical Coupling Elements

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MEMORANDUM IN SUPPORT OF  
PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The present invention and prior art have been summarized in Applicants' prior responses.

STATEMENT OF GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 through 23 are pending in the above-identified patent application. Claims 1-6, 10, 11, and 14-23 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kuhmann et al. (United States Patent Number 6,832,013) in view of Gallup et al. (United States Patent Number 6,982,437), claims 7 and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kuhmann et al. in view of Gallup et al., and further in view of Chan et al. (United States Patent Number 5,122,852), claim 9 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kuhmann et al. in view of Gallup et al., and further in view of Burns (United States Patent Application Publication

Number 2001/0046346), claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kuhmann et al. in view of Gallup et al., and further in view of Burdick, Jr. et al. (United States Patent Application Publication Number 2002/0075107), and claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kuhmann et al. in view of Gallup et al., and further in view of Burdick, Jr. et al., and further in view of Coyle, Jr. et al. (United States Patent Number 5,101,090).

Independent Claims 1 and 21

Independent claims 1 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kuhmann et al. in view of Gallup et al. Regarding claim 1, the Examiner acknowledges that Kuhmann does not teach one or more cavities having a defined positioning and depth in the circuit board, but asserts that Gallup teaches using one or more etch stop layers to selectively remove material to provide one or more cavities having a defined positioning and depth in the circuit board (FIG. 5A and col. 6, lines 8-17).

Applicants note that the present disclosure teaches that “the openings having a defined positioning and depth in the circuit board, fabricated using the above methodology, may be employed to optimize the alignment of optical components with waveguides.” (Page 3, lines 12-14.) The present disclosure also teaches, for example, that the cavity provides “alignment along the x axis and y axis” (page 13, lines 21-24), and also teaches that such alignment typically requires an accuracy *better than 50 μm, e.g., 5 μm* (page 6, lines 1-12; emphasis added). Kuhmann, however, is directed to “alignment features” that *protrude from lower layers of an assembly structure* (see, Abstract and FIGS. 5, 6, and 9-18). As the Examiner acknowledges, Kuhmann does not disclose or suggest cavities in a circuit board.

Applicants also note that Gallup teaches a cavity 540 (col. 6, lines 8-17) and that a “laser 610 can be hermetically sealed in a cavity 640” (col. 6, lines 59-61). Applicants note that FIGS. 1, 2, 6, and 7 clearly illustrate that the components located inside the cavity are not in contact, nor nearly in contact, with the cavity walls and, thus, a person of ordinary skill in the art would not view the cavity as being used for aligning the components. Thus, in the absence of a teaching by Gallup that the cavity is used for

aligning components, a person of ordinary skill in the art would not read Gallup as teaching that the cavities are utilized for aligning optical components. Gallup, therefore, does **not** disclose or suggest that the cavity is *utilized for aligning a component* and does **not** disclose or suggest that the cavity 540, 640 has a *defined positioning, as defined in the present specification* (see, for example, FIGS. 1, 2, 6, and 7 of Gallup). Independent claims 1 and 21 require using one or more etch stop layers and providing *one or more cavities* having a **defined** positioning and depth in the circuit board, wherein said one or more cavities provide for the alignment of optical elements. Neither Gallup nor Kuhmann disclose or suggest a *cavity having a defined positioning*, as defined in the present specification.

In addition, Applicants note that the independent claims have been amended to emphasize that the one or more cavities are provided for aligning one or more optical elements. Applicants also maintain that a person of ordinary skill in the art would not look to combine Gallup and Kuhmann since Gallup does not disclose or suggest utilizing a cavity for aligning elements.

Thus, Kuhmann and Gallup do not disclose or suggest using one or more etch stop layers and providing *one or more cavities* having a defined positioning and depth in the circuit board, wherein said one or more cavities provide for an alignment of one or more optical elements, as required by independent claims 1 and 21.

#### Additional Cited References

Chan was also cited by the Examiner for its disclosure of etch stop layers comprising gold. Applicants note that Chan is directed to grafted-crystal-film integrated optics and optoelectronic devices. Chan does **not** address the issue of creating cavities having a defined positioning and depth in a circuit board.

Burns was also cited by the Examiner for its disclosure of etch stop layers comprising a reflective dielectric thin film. Applicants note that Burns is directed to a micromachined structure and to an opto-mechanical micromachined switch (paragraph 0001). Burns does **not** address the issue of creating cavities having a defined positioning and depth in a circuit board.

Burdick was also cited by the Examiner for its disclosure of removing material using laser ablation techniques. Applicants note that Burdick is directed to a method for forming an interconnect structure. Burdick, however, does *not* address the issue of creating cavities having a defined positioning and depth in a circuit board.

5 Coyle was also cited by the Examiner for its disclosure of the use of a carbon dioxide laser for laser ablation techniques. Applicants note that Coyle is directed to methods and apparatus for making optical fiber couplers. Coyle does *not* address the issue of creating cavities having a defined positioning and depth in a circuit board.

10 Thus, Chan et al., Burns, Burdick, Jr. et al., and Coyle, Jr. et al., alone or in combination, do not disclose or suggest using one or more etch stop layers and providing *one or more cavities* having a defined positioning and depth in the circuit board, wherein said one or more cavities provide for an alignment of one or more optical elements, as required by independent claims 1 and 21.

#### Claim 16

15 Dependent claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Kuhmann et al. in view of Gallup et al. Regarding claim 16, the Examiner asserts that Kuhmann discloses that the at least one optical component comprises one or more alignment pins (FIG. 19: element 48) each having a shape that corresponds with openings, wherein the alignment pins are circular.

20 Regarding element 48, Kuhmann teaches that

25 second alignment features, such as *solder stripes 48*, positioned symmetrically around the active region 28 are formed on the lower surface of the optoelectronic device 25. The active region 28 will be horizontally aligned with the waveguide 18 when the optoelectronic device 25 is moved towards the waveguide 18 until the *solder stripes 48* abut the tapered side surface parts of the alignment feature 42. In order to fix and provide electrical connections to the optoelectronic device 25, the solder stripes can be melted forming a binding electrical connection to a metallized region 44. Alternatively, the second alignment features can be

30 formed by other structures than *solder stripes 48*, such as one or more silica structures. In this case, the fixation and the electrical connection can be formed by a solder stripe 50 forming a binding electrical connection to a metallized region 46.

(Col. 18, lines 13-29; emphasis added.)

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A person of ordinary skill in the art would recognize that solder stripes are *not alignment pins*. Applicants also note that Kuhmann does not disclose or suggest that the alignment pins have a shape that corresponds with the cavities. Dependent claim 16 requires wherein the at least one optical component comprises one or more *alignment pins each having a shape that corresponds with one or more of the one or more cavities*.

Thus, Kuhmann et al. and Gallup et al., alone or in combination, do not disclose or wherein the at least one optical component comprises one or more alignment pins each having a shape that corresponds with one or more of the one or more cavities, as required by claim 16

Dependent Claims 2-20 and 22-23

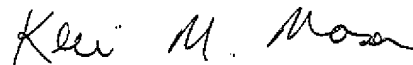
Claims 2-20 and 22-23 are dependent on claims 1 and 21, respectively, and are therefore patentably distinguished over Kuhmann et al., Gallup et al., Chan et al., Burns, Burdick, Jr. et al., and Coyle, Jr. et al. (alone or in any combination) because of their dependency from independent claims 1 and 21 for the reasons set forth above, as well as other elements these claims add in combination to their base claim.

All of the pending claims, i.e., claims 1-23, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below

The Examiner's attention to this matter is appreciated

Respectfully submitted,



Date: November 14, 2006

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